

D'Orbigny (Ann. Sc. Nat. vii. p. 264) refers to *Textularia Capreolus*, DeFrance; but it does not appear in the Dict. Sc. Nat.

134. *Vorticialis craticulata*, F. & M. sp. Dict. xxxii. p. 181; Atlas, Conch. pl. 15. f. 6; Bl. Malac. p. 375, pl. 7. f. 6. A large variety of *Polystomella crispa*, Linn. sp. See Ann. Nat. Hist. ser. 3. v. p. 105, and Carpenter's 'Introduction,' p. 279, pl. 16.

135. *Vorticialis crispa*, Linn. sp. Dict. xxxii. p. 181; Bl. Malac. p. 375. This is the *Polystomella crispa*, Linn. sp. Lamarck's generic name "*Vorticialis*" is not required.

136. *Vorticialis marginata*, Lam. sp. Dict. xxxii. p. 181; Bl. Malac. p. 375. This is *Polystomella crispa*, Linn. sp., var. *strigilata*, subvar. β , F. & M. Ann. Nat. Hist. ser. 3. v. p. 105.

137. *Vorticialis strigilata*, F. & M. sp. Dict. xxxii. p. 181; Bl. Malac. p. 375. *Polystomella crispa*, var. *strigilata*. This, like the foregoing, is a somewhat flattened variety.

XXII.—*A List of the Formosan Reptiles; with Notes on a few of the Species, and some Remarks on a Fish (Orthagoriscus, sp.).*

By R. SWINHOE, F.Z.S., F.G.S. &c., H.M. Vice-Consul at Formosa.

I PROCURED at Formosa the following fifteen species of Reptilia, which have since been deposited in the British Museum. Dr. Günther has determined their species, and is describing the novelties in the British Museum Catalogue now publishing. To that gentleman's kindness I am indebted for the names.

CISTUDINA (Tortoises).

1. *Emys sinensis*, Gray.

Abundant about the pools and inland waters of South-west Formosa, near Taiwanfoo. They were brought to me by the natives there in large numbers. I forwarded five live specimens to England as a present to the Gardens of the Zoological Society. Three of them arrived safe, and are now exhibited in the menagerie at the Regent's Park.

2. *Trionyx sinensis*, Coregm.

Very abundant in the rivers near Amoy, but rather rare in South-west Formosa, where I procured but a very few examples. It has a long projectile neck, and very sharp teeth, with which it can inflict a severe bite. When once it seizes an object,

it is with the utmost difficulty that it can be prevailed upon to let go. The Chinese boil it into soup, and esteem it a great delicacy for the table; hence it commands rather a high price.

Genus *CISTOCLEMMYS*, J. E. Gray.

“Thorax convex, solid. Sternum nearly flat, rounded before and behind; the front lobe large, partly enclosed in the symphysis. The fore feet subclavate; the toes very short, nearly enclosed, not webbed; the claws short, blunt. The hind feet elephantine, subcircular; toes very short, enclosed. Soles with two series of large prominent shields; the hinder edge keeled, but scarcely produced. Tail shielded beneath. Asiatic.

“This genus, in the convex and solid structure of the thorax, is like *Cistudo*; but the foot is more like that of the land Tortoises; and the hind foot is subcylindrical, instead of elongate as in the American genus.

3. “*Cistoclemmys flavomarginata*, n. sp.

“*Cuora trifasciata*, var., Gray, Cat. Shield Reptiles in Brit. Mus. p. 42, specimen c.

“Dark brown; shields of the back deeply concentrically grooved; the sternum flat, black; the lower side of the margin of the thorax yellow; head olive, temple yellow, with a yellow streak on each side of the crown, becoming wider and triangular behind.

“The surface of the shell is often more or less eroded; the one which we first received from Mr. Reeves was so on the whole upper surface. The form of the foot, as well as the height and thickness of the shell, at once separates this species from *Cuora trifasciata*, with which I formerly confounded it.” (J. E. Gray, P.Z.S. 1863, p. 175.)

In the British Museum there is a specimen of this species brought home by Mr. Reeves from Canton. I should think that it was more than probable that the animal had been carried to that port in a junk, and is not indigenous to that locality; for in Formosa I found it extremely local. It did not occur in the South-west at all; but about Tamsuy, North-west Formosa, it was the prevailing species. I frequently observed it in ponds about the rice-fields, with its round back showing above the surface of the water and its head peering out. At times several might be seen together on the tops of stones in the water, basking motionless, with limbs extended. On being alarmed they would shuffle off the stones with all the energy in their power, and plunging into the water, sink immediately. If the observer

kept quite still, after the lapse of a few seconds they would again reappear at the surface.

4. *Chelonia virgata*, Schneid.

The Green Turtle of Europeans in China is of frequent occurrence, often of a large size in the warm waters of the Gulf Stream on the east of Formosa. At Sawo it is taken in large numbers, dried, and cut up into thin strips for food. It is of rarer occurrence on the west coast, where it is oftenest found in spring. On the Chinese coast it is a great rarity. There the fishermen have great reverence for it, as it is regarded as the emblem of longevity. When accidentally entangled in the fishing-nets, it is carried to the nearest large town and exhibited for a short time. It is then usually purchased from its captors by some well-to-do native, who has a few "good words" carved on its back, in company with his own name and the date, and fills-in the inscription with vermilion. The animal is then decked with ribbons, and carried in a boat, with much ceremony, out to sea, where it is consigned with state into its native element. Some very large specimens were brought from Sawo to Tamsuy; they were kept in a boat filled with water during the day. In the evening we used to bring them out on to the deck of a vessel. One of them, for several consecutive evenings at 8 o'clock precisely, would commence scratching the deck with her fore flappers, and then set-to laying eggs, usually twelve in number. She would then turn round and commence pushing and scraping with her hind flappers—evidently the manœuvre she was in the habit of going through on the sandy beach, first scratching a hole for the reception of the eggs, then filling it up. I had one alive for some time in the yard of my house. It used to lie motionless in the rain-puddles, with only the tip of its head uncovered. When the thermometer fell below 50° it would sally out of the water, and not return till it grew warmer.

5. *Caretta squamata*, Bont. (Tortoise-shell Turtle).

One of this species was brought to me at Tamsuy about the 25th of January 1861. It was very lively, and much more active than the Green Turtle, walking about the floor with an awkward but somewhat rapid gait. In walking it inclined the inner edge of its fore flapper up, so as to bring the claw of the outer edge as a purchase on the ground. It was killed by a deep incision in the neck above the thorax. Thus wounded, it flapped about from 1.30 till 4 P.M., when it ceased to move; but at 11 P.M., when I dissected the animal, I found the heart still beating, and the muscles sensible to touch and conveying motion to the limbs, though other signs of life had ceased. The

stomach contained bits of algæ in small quantity; but the small gut was choked with bits of black stone and shell mixed with algæ. The measurements, taken from the fresh animal, were as follows:—

Length of carapace	14 inches.
Breadth of carapace	12
Length of flapper	$7\frac{8}{10}$
Greatest breadth of flapper	$2\frac{1}{10}$
Length of head	$3\frac{3}{10}$
Length of head to edge of carapace . .	$5\frac{3}{10}$
Hind flapper from knee	5
Greatest breadth of hind flapper	$2\frac{1}{2}$

SAURIA (Lizards).

6. *Gecko Swinhonis*, Günther, n. sp.

The specimens of small *Gecko* I brought home from Taiwanfoo Dr. Günther of the British Museum has described as new. I did not observe it in North-west Formosa; but in the South-west it was especially abundant, and I had numerous opportunities of making notes on its habits. I therefore make no apology for extracting the following long account from my journal of observations on this animal, together with the strange native legend regarding it.

On the plaster-washed side of my bedroom, close to the angle of the roof, every evening when the lamp was placed on the table below, four little musical lizards used to make their appearance, and watch patiently for insects attracted by the light. A *Sphinx* or a beetle buzzing into the room would put them into great excitement, and they would run with celerity from one part of the wall to the other after the deluded insect as it fluttered in vain, buffeting its head, up and down the wall. Two or three would run after the same insect; but as soon as one had succeeded in securing it, the rest would prudently draw aloof. In running over the perpendicular face of the wall they keep so close, and their movements are made so quickly with one leg in advance of the other, that they have the appearance at a distance of gliding rather than running. The tail is somewhat writhed as the body is jerked along, and much so when the animal is alarmed and doing its utmost to escape; but its progress even then is in short runs, stopping at intervals and raising the head to look about it. If a fly perch on the wall, it cautiously approaches to within a short distance, then suddenly darts forwards, and with its quickly protruded glutinous tongue fixes it. Apart from watching its curious manœuvres after its insect food, the attention of the most listless would be

attracted by the singular series of loud notes these creatures utter at all hours of the day and night, more especially during cloudy and rainy weather. These notes resemble the syllables "chuck-chuck" several times repeated, and, from their more frequent occurrence during July and August, are, I think, the call-notes of the male to the female. During the greater part of the day the little creature lies quiescent in some cranny among the beams of the roof or in the wall of the house, where however it is ever watchful for the incautious fly that approaches its den, upon whom it darts forth with but little notice. But it is by no means confined to the habitations of men. Every old wall, and almost every tree, possesses a tenant or two of this species. It is excessively lively, and even when found quietly ensconced in a hole, generally manages to escape,—its glittering little eyes (black, with yellow-ochre iris) appearing to know no sleep; and an attempt to capture the runaway seldom results in more than the seizure of an animated tail, wrenched off with a jerk by the little fellow as it slips away, without loss of blood. The younger individuals are much darker than the larger and older animals, which are sometimes almost albinos. In ordinary fly-catching habits, as they stick to the sides of a lamp, there is much similarity between this Gecko and the little *Papehoo* or wall-lizard of China; but this is decidedly a larger and more active animal, and often engages in a struggle with insects of very large size. I once watched a Gecko seize a *Sphinx* moth; but the insect, after a serious struggle, succeeded in breaking loose from it, not, however, without having been too seriously injured to live. I was assured by a medical friend at Amoy that he saw in his verandah there a large spider (*Mygale* species) quietly sucking the body of a *Papehoo*. I suspect it would take a very large spider to pay the same respects to a Formosan Gecko.

I have found the eggs of this Gecko in holes in walls or among mortar rubbish. They usually lie several together, are round, and did not seem to me to offer any appearance other than those of ordinary lizards. The young, when first hatched, keep much to themselves under stones in dark cellars, where they live until they attain two-thirds the size of the adults. At this stage they begin to show out in conspicuous places, but always evince alarm at the approach of their older brethren; for what reason, I could not make out. A little fellow that lived behind some small boxes on my table, and used to sally out to catch the smaller insects attracted by the lamplight, would always scurry away as soon as he spied one of the larger tenants of the roof-top gliding down with hurried strides. It may have been puerile modesty, or perhaps he was aware that his precocity

had induced him to affect a field to which he had no right in the presence of his seniors.

The Chinese colonists show a respect for these animals, and will not suffer them to be molested on the walls of their houses. They relate a legend as the cause of this veneration. Many years since, some rebels had taken possession of the Fungshan Hien (the southernmost district of the Chinese territory in Formosa), and were threatening the capital itself, when the emperor sent across from China a celebrated general to quell the insurgents. This valiant warrior had made several onslaughts on the enemy, which only resulted in defeat and the decimation of his army. He sat one evening desponding gloomily, when suddenly his attention was drawn to something chuckling over his head. He looked up and spied a Gecko, which, to his astonishment, spoke out, and asked him the cause of his despondency. The warrior, thinking that perhaps some good spirit was embodied in the little creature, unbosomed his grief to it. The lizard replied that by means of certain secretions in its body it could speedily poison the supplies of the enemy's troops, and thus reduce their strength to a shadow, and that the general could proceed and make short work of them. The brave warrior was delighted at the project, and promised, should the plot succeed, that he would recommend the lizard to the emperor for distinction. The lizard was as good as his word, and next morning large numbers of his tribe were observed making their way to the Fungshan Hien; and in a few days rumour reached the anxious general that the enemy were dying off by scores, and that their strength was fast reducing to a shadow. Whereupon he gathered his troops together, and soon succeeded in cutting to pieces the miserable remnant of the once invincible rebel band. The warrior returned elate from his victory. The lizard was at his usual spot on the wall, and chuckled louder than ever at the success of his plans, claiming for himself and four-footed companions the promised distinction. The general was true to his word, and memorialized the emperor on the subject, who graciously ordained that henceforth the tribe of Formosan Geckos should receive the rank of *generals*, and be respected by all classes of men. The Geckos, on hearing the good news announced, assembled and chuckled in concert; and since then, every house possesses its small family of miniature generals, who manœuvre about the walls and destroy the mosquitoes and other insect pests that plague the colonists, as successfully as their forefathers did the rebels; and when the thunder roars and the lightning flashes, they think of the valiant deeds of their ancestors, and, in the true spirit of generals, chuckle louder than usual at what reminds them of the din of battle.

7. *Mabouia chinensis*, Gray.

Found near Tamsuy. Ascends plants, and basks among their leaves in the sunshine.

8. *Iapalura Swinhonis*, Günther.

One of the comb-backed tree-lizards; procured also at Tamsuy.

OPHIDIA (Snakes).

9. *Coluber rufodorsatus*, Cant.

From Tamsuy.

10. *Simotes Swinhonis*, Günther, Brit. Mus. Cat. 1863.

From Tamsuy.

11. *Tropidonotus annularis*, Hallow.

From Tamsuy.

12. *Tropidonotus stolatus*, L.

From Tamsuy.

13. *Bungarus semifasciatus*, Kuhl.

A black-and-white banded snake, also common at Amoy in China. Frequently resorts to cellars and under houses, where it feeds on rats. Its bite is very deadly.

14. *Pelamis bicolor*, Schneid.

Common about the coral-reefs at Kelung, North Formosa. Is occasionally washed into the Tamsuy River.

15. *Halys Blomhoffi*, Boie.

From Tamsuy.

The few fish I brought home from South-west Formosa and Tamsuy Dr. Günther has not yet had time to determine. I therefore cannot now give a list of them. I will only add a few remarks on a species of that extraordinary genus *Orthogoriscus*, which is probably the same as that described from Japan in Von Siebold's 'Fauna Japonica.'

Orthogoriscus, sp. (Sun-fish).

On the 21st of March 1862, some six miles up the Tamsuy River, a large fish was observed close to a ship in harbour. It floated near the surface of the water, moving lazily along, splashing about its dorsal flapper. It must have been injured; for when a boat pulled up to it, it made no resistance, but allowed itself to be taken hold of by the fin, and a rope to be

passed round its body. The Chinese say that it is not rare in the adjoining sea. They call it *Tay-siun Ho*. They eat the skin, and describe it as crumbling in the mouth like biscuit; but the fleshy portions boil away to nothing, and are not worth the trouble of putting in the pot. The specimen measured in length 5 feet 6 inches; across from tip to tip of fins 6 feet; length of fin 18 inches. It weighed 187 lbs. The intestine was thick and fleshy, and measured 21 feet long, the duodenum being $3\frac{1}{2}$ inches and the gut about $1\frac{1}{2}$ inch broad. It had one thick fleshy cæcum about 9 inches from the anus, $3\frac{1}{2}$ inches long by 2 broad. The urethra has an opening distinct from the anus, and squirted out water when the animal was stepped upon. Its stomach was empty; but in the cavity between it and the flesh was a long yellow tapeworm, with numerous small parasitic grubs like the larvæ of the lady-bird (*Coccinella*), yellow and black, attached to different parts of it. Outside the skin about the gills were sticking several large fish-lice. When first caught, several sucking-fish were found fastened to its skin; these had been torn off, and left bare and raw patches. Unfortunately they were thrown away before I saw them. I observe Cuvier says that this order of fish has no cæca. Has this genus ordinarily none?

XXIII.—On *Raphides* and *Sphæraphides* of *Phanerogamia*; with a Notice of the *Crystal Prisms* of *Iridaceæ*. By GEORGE GULLIVER, F.R.S.

[Plate IV. fig. 13.]

Of the terms *Raphides* and *Sphæraphides*.—I have commonly used the term *Raphides* according to its etymological import (*ῥαφῖς*, *acus*, *subula*; fr. *ῥάπτω*, *suo*, *consuo*), as proposed by DeCandolle, for the needle-like forms, though it has generally been applied to all microscopic crystals, of what shape soever, occurring in plants—thus causing such inconvenience that the word should either be discarded or others used for crystals and their aggregations of totally different shapes. Whenever either the figure or chemical composition of them can be clearly defined, a satisfactory designation follows as a matter of course; but this often cannot be done, especially with those very minute crystals which occur most frequently. These, however, are so commonly grouped in a particular manner, and are so widely diffused throughout the phænogamous class, that a particular word seems to be required to distinguish them, for the present, from the typical raphides. As this last term has been so generally adopted, we might retain it generically, and add some